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Status of the Giant Scallop (*Placopecten magellanicus*) fishery in the southern Gulf of St. Lawrence (Fisheries and Oceans, Gulf Region) - 1990 update.

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ABSTRACT

The scallop fisheries catch and effort data for the Gulf of St. Lawrence (Department of Fisheries and Oceans, Gulf Region) were provided by the Program Coordination and Economics Branch for the years 1968 to 1990. The information was sorted and compiled to obtain landings (kg of scallop meat, scallop roe and live scallop), landed values and price/kg for each of the four scallop fishing areas in the southern portion of the Gulf of St. Lawrence. Supplementary B landings (estimations of landings not sold to a registered buyer) were sorted and presented separately. The fishing effort was estimated by sorting the catch and effort data by Canadian Fishing Vessel (CFV) number. The potential fishing effort was estimated from the number of scallop fishing licences issued in 1990 in each fishing area.

Results showed that the fishery in area 21 is the only area where landings have improved from 1987 to 1990. It is also the fishing area where most of the scallop roe (product consisting of the roe and adductor muscle attached) landings were reported. Historically, fishing areas 22 and 24 had the highest landings and number of active fishing vessels. Landings in these two areas have declined substantially in the last 20 years. This overall decline of the resource may explain the high proportion of inactive licence holders and the most restrictive effort regulations (management measures). The effectiveness of some resource management measures is discussed.

RÉSUMÉ

Les données de capture et d'effort des pêcheries de pétoncles dans le golfe du Saint-Laurent (Ministère des Pêches et des Océans, Région du Golfe) ont été obtenues de la direction de la coordination des programmes et services économiques pour les années 1968 à 1990. Les données ont été triées et compilées afin d'obtenir les débarquements (kg de viandes de pétoncles, gonades, et pétoncles vivants), les valeurs débarquées et le prix/kg pour chacun des quatre secteurs de pêche du pétoncle dans la partie sud du golfe du Saint-Laurent. Les débarquements Supplémentaires B (estimations des débarquements qui ne sont pas vendus à un acheteur enregistré) ont été traités et présentés séparément. L'effort de pêche a été estimé par un tri des données de capture et d'effort en fonction du numéro de Bateau de Pêche Canadien (BPC). L'effort de pêche potentiel a été estimé à partir du nombre de permis de pêche du pétoncle émis en 1990.

Les résultats montrent que la pêcherie du secteur 21 est la seule qui a connu une amélioration des débarquements entre 1987 et 1990. Ce secteur de pêche est aussi celui qui connaît la presque totalité des débarquements de gonade de pétoncle (produit qui consiste en la gonade attachée au muscle adducteur). Historiquement, les débarquements et le nombre de bateaux de pêche actifs étaient les plus importants dans les secteurs de pêche 22 et 23. Les débarquements de ces deux secteurs ont diminué de façon substantielle depuis les 20 dernières années. Ce déclin général de la ressource est la raison probable pour la proportion élevée de détenteurs de permis de pêche inactifs et de la présence d'une réglementation sévère de l'effort (mesures de gestion). L'efficacité de certaines mesures de gestion de la ressource est discutée.

INTRODUCTION

The giant scallop (*Placopecten magellanicus*) is commercially harvested along the coast of the Atlantic provinces and is an important part of the economy of coastal communities. For 1988, 1989 and 1990, the total annual Giant Scallop landings for the entire Gulf of St. Lawrence was 307 t, 402 t and 421 t of scallop meat (adductor muscle) respectively[a]. This represented a landed value ranging from 3 to 4 million dollars annually.

The fishing grounds are sub-divided into fishing areas and are managed by two regions, the Québec Region and the Gulf Region. The Gulf Region encompasses the southern gulf of St. Lawrence and includes the coastal waters of New Brunswick, Prince Edward Island and Nova Scotia. The western coast of Newfoundland is also part of the Gulf Region but contributes little to the total landings of giant scallop. Most of the scallop landings from the western coast of Newfoundland are Iceland scallops (*Chlamys islandica*) another scallop species found in deeper, colder waters.

The scallop fishery in the southern Gulf of St. Lawrence (Gulf Region) is divided in four fishing areas (Figure 1). Each fishing area is managed independently: having its own season, gear specifications and fishermen. The fishery has been characterized by its dramatic fluctuations in fishing effort and landings (Lanteigne and Davidson, 1988, 1991; Lanteigne *et al.*, 1987) and controlled mainly by socio-economic factors. It is considered as a supplementary fishery to the lobster fishery, with its seasons and regulations often established around lobster fishing activities.

The present document is an overview of the fisheries statistics for the giant scallop landed in the southern portion of the Gulf of St. Lawrence: specifically scallop fishing areas 21, 22, 23 and 24. The information is presented to highlight the socio-economic aspects of the fishery and to provide a basis for discussion on ways to better manage the fishery.

MATERIALS AND METHODS

The fisheries statistics data were provided by the Program Coordination and Economics Branch (PCE Branch) of the Department of Fisheries and Oceans, Gulf Region, which is responsible for collecting and compiling the fishery catch and effort data. The data from 1968 to 1990 were analyzed in the present study. The 1991 fisheries statistics were not available for analysis.

The data were sorted using the method described by Lanteigne and Davidson (1991). The three landing types reported in the landing statistics since 1968 were compiled separately as scallop meat (adductor muscle), scallop roe (adductor muscle with gonad), and live scallop (in the shell). Starting in 1982, the different types of transactions between a fisherman and a fish product buyer were also sorted separately to reflect the landings reported on regular, supplementary B, and supplementary A proof of purchase forms (often call sale slips). Supplementary B transactions are special forms reporting estimations of scallop landings not sold to a registered buyer and not reported on standard transaction forms (Lanteigne and Davidson, 1991). These estimations are provided by Fisheries and Oceans representatives (ie: fishery officers) working in the different fishing communities. Supplementary A transactions are those reports of sales with a registered buyer on an irregular basis. A buyer may request special permission to conduct one or multiple transactions in a fishing area. Supplementary A sale transactions are rare.

The fishing effort was estimated by sorting the catch and effort data by Canadian Fishing Vessel (CFV) number. Any fishing vessel that recorded at least one transaction was considered as an active fishing vessel. The potential fishing effort was estimated from the number of fishing licences issued in 1990 in each fishing area, by assuming that each licence represented one fishing vessel.

RESULTS AND DISCUSSION

The scallop meat (adductor muscle) landings and landed values for all fishing areas of the Gulf Region (excluding Newfoundland) are presented in Figure 2 and Appendix I. Following the highest landing of 901 t in 1968, the annual landing of scallop meat decreased to 202 t by 1974. Since 1984, the annual landings have fluctuated between 194 t and 384 t. These landings represent landed values ranging between two and three million dollars annually. The landed value fluctuations followed the fluctuation of the price paid to the fishermen for scallop products. These prices increased from $3.11/kg in 1974 to $13.90/kg in 1986. The 1980's were exceptional years for the fishery in the southern Gulf of St. Lawrence in terms of landed value. This peak $/kg was followed by a decrease to $10.00/kg in 1988.

Supplementary B transactions in the catch and effort have been identified since 1982. There value has increased steadily and represented 32% in 1989 and 35% in 1990 of the total scallop meat landed in the southern Gulf of St. Lawrence (Figure 2 and Appendix II). These estimated landings are an important source of bias and must be considered carefully when attempting to estimate accurately the total catch and fishing effort for stock assessment purposes.

Live scallop (in the shell) landings and their landed values for all fishing areas combined are presented in Figure 3 and in Appendices I and IV. These landings have been very sporadic throughout the years. It is noted that large quantities of live scallops were reported in 1968 (4976 t) and represented 54% of the total landed value that year. This may be an error in the catch and effort statistics but cannot be verified.

With the exception of 1984, scallop roe landings have been reported annually since 1979 (Figure 4, Appendix V). Large fluctuations of landings were observed ranging from 1,000 kg in 1988 to 11,300 kg in 1981. No scallop roe landings were reported in 1990.

The fishing effort from 1986 to 1990 is presented in figure 5 in terms of number of active fishing vessels. The number of active fishing vessels in all four scallop fishing areas of the Gulf Region has fluctuated between 356 and 559. This represented from 46% to 72% of the total possible 781 licence holders. The 1990 proportions of active and inactive licences are presented in figure 6 for the entire Gulf Region and for each fishing area.

From 1986 to 1989, a number of fishing vessels were landing their scallop product outside the statistical districts of the Gulf Region (Figure 5). Even though these fishing vessels were active participants of the southern gulf scallop fishery, sorting the catch and effort data files could not identify the fishing area where these vessels fished. This was not a problem in 1990 as no landings outside the Gulf Region were reported in the catch and effort data.

The management of the scallop fishery is conducted on a fishing area basis. In each area, representatives of fishing communities are selected or elected to attend at the annual Scallop Advisory Committee Meeting for their respective fishing area. These representatives actively participate with federal and provincial officials (managers) to establish management strategies to maintain a profitable fishery and a sustainable resource. Historically, there has been three management measures taken in the different fishing areas to control the fishing effort:

1) Fixing the meat count (number of scallop adductor muscles per unit of weight).
2) Fixing the fishing seasons.
3) Fixing the scallop dredge width.

A fourth measure, although discussed but never applied, was:

4) Controlling the number of licences.

FISHING AREA 21

The scallop fishing management plan in area 21 (formerly 7C) consists of a fishing season from May to December (9 months), a meat count of 39 adductor muscles per 500g, and a maximum dredge size of 6.1m^2 (20 feet).

The opening and closing dates of the fishing season change annually but the total duration (fishing days) remain unchanged.

Scallop meat landings in fishing area 21 have increased substantially from 26 t in 1986 to more than 90 t in 1990 (Figure 7, Appendix III). This increase is probably the result of an increase of fishing effort as identified in Figure 5. In 1990, 81.2% of the licence holders have recorded at least one transaction during the season (Figure 6) and this left only 19 inactive licence holders in 1990.

The proportion of supplementary B's in the catch data has also increased from 15% in 1986 to 25% in 1990. The increase of supplementary B's coincided with the decrease of the price ($/kg) paid to the fishermen. As the price of scallop meat decreased, the fishermen were more inclined to sell their product directly to the public at a better price.

Most of the scallop roe landed in the Gulf Region was reported in fishing area 21 (Appendix V). The long fishing season favours roe landings as fishing activities are conducted during the period when the gonads are ripe (June to August).

FISHING AREA 22

The fishery management plan in fishing area 22 (formerly 8) consists of a 9 to 10 week fishing season (from the end of April to the end of June), a meat count of 52 adductor muscles per 500g and a dredge width fixed at 4.9m^b (16 feet in 1990, was 16 feet, 8 inch in 1989). This fishing area has the shortest fishing season of all areas considered in the present study.

Scallop landings in fishing area 22 have fluctuated between 46 t and 313 t from 1969 to 1990 (Figure 8). A large quantity of live scallop (3,786 t) was reported in 1968, representing 63.9% of the total landed value in area 22 for that year (Appendices III and IV). These live scallop landings may again be the result of errors in the data that cannot be validated.

No trends were detected in the scallop meat landings over the past 20 years. However, the proportion of supplementary B's have increased since 1988, to a high of 40% of the total 1990 scallop landings in the fishing area. This fishing area was characterized by a stable fishing effort ranging between 144 and 160 fishing vessels from 1986 to 1990 (Figure 5). This fishing effort represented approximately 70% of all the licence holders for the area. The fishermen of area 22 are of the opinion that the resource has declined in the past few years with no signs of improvement for 1991.

The end of the fishing season in area 22 coincide with the beginning of the gonad development period therefore, scallop roe landings are rare (Appendix V).

FISHING AREA 23

The fishing season in area 23 (formerly 7B) is approximately nine months, from April to December. The other management measures include a meat count of 52 adductor muscles per 500g and a maximum dredge size of 6.6m^b (21 feet, 6 inches).

Scallop meat landings in fishing area 23 are low and sporadic compared to the other fishing areas (Figure 8). As in area 22, a large volume of live scallop was landed in 1968 which could be the result of data entry errors. When not considering 1968, the largest landings were observed in the early 1980's when the price offered for the scallop was at its highest. Since 1987, scallop meat landings have not exceeded 0.5 t. No trends can be detected and the status of the stock in that fishing area is unknown.

Since 1987, the annual fishing effort has been minimal or non existent (Figure 5). Of a maximum of 50 licence holders in 1990, only 2 fishermen fished scallop (4%). This pool of inactive licences represent a potential fishing effort that may increase the effort substantially.

FISHING AREA 24

There are two fishing seasons in area 24 (formerly 7B1). The spring season is from mid-April to the end of June (10-11 weeks) and the fall season is from October to December (13-14 weeks). The opening and closing dates of the seasons are decided annually by the Scallop Advisory Committee for that area. The meat count is fixed at 52 adductor muscles per 500g and the width of the dredge to 5.1m[b] (16 feet, 8 inches).

The landings in fishing area 24 are characterized by an important decrease in the past 20 years (Figure 10). Landings were highest in 1969 with 408 t and have decreased since then to level off at approximately 80 t annually. As in fishing area 22 and 23, a large quantity of live scallops was reported in 1968 which represented 36% of the total landed value for that year. In area 24, the supplementary B landings represent a large proportion of the total landings. In 1985, supplementary B landings represented 12% of scallop landings in area 24. From 1986 to 1990, they represented from 22% to 47% of the total scallop landings in the area.

The fishing effort in area 24 has decreased from 217 active fishing vessels in 1986 to 108 vessels in 1989 (Figure 5). It increased in 1990 to 187 vessels which represented 44% of the possible 422 licence holders (Figure 6). This area has the largest number of active and inactive fishermen. The fishing area is characterized by a large number of licence holders that may enter the fishery at any time.

CONCLUSION

It has always been difficult to predict the short and long terms status of the giant scallop populations in the southern Gulf of St. Lawrence as reported by Lanteigne and Davidson (1988), Lanteigne *et al.* (1987) and Worms *et al.* (1986). Regulations, effort levels, fishing gear specifications and fishing strategies change annually and from one fishing area to the other. Furthermore, complex socio-economic factors directly and indirectly influence the annual variability (ie: market value of scallop product, economic status of the other complementary fisheries).

An analysis of the available catch and effort data is only amenable to a qualitative description of the fishery. The fishery in area 21 was the only one where landings improved from 1987 to 1990. It is also the fishing area where most of the scallop roe landings are reported, providing an added value to scallop product landed that is not present in other areas. The "scallop roe" landing information consists of the female roe attached to the adductor muscle. It should be noted that adding the roe landed weights to the scallop meat landed weights without taking into consideration a conversion factor induces a significant bias to the statistic data which is more important in fishing area where important quantities of scallop roe are landed. Unfortunately, a conversion factor has not yet been determined.

Historically, fishing areas 22 and 24 have had the highest landings and number of active fishing vessels. Landings in these two (2) areas have declined substantially over the last 20 years. From 1987 to 1990, even though the duration of the fishing seasons did not change (32 weeks in area 21 and 23-25 weeks in area 24), the landings in area 21 increased and reached values similar to the landings in area 24. This overall decline of the resource in the last 20 years in fishing area 22 and 24 is probably the reason for the high proportion of inactive licence holders and the most restricted effort regulations (management measures) when compared with the other fishing areas. The fishermen in those areas were the first to initiate fishing effort reduction measures by setting short fishing seasons and by fixing the width of the fishing gear. So far, these measures have not been sufficient to increase the landings to what they were in the past.

When management measures are taken, the number of licences (active and inactive) should be considered. Otherwise, even if the abundance of the scallop populations increases, there is a large number of inactive licences which could become active at anytime. If the number of potentially active fishermen is ignored, any

management measure based on length of the fishing season and width of the fishing dredge to control the fishing effort could be futile.

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Lanteigne, M., L.-A. Davidson and J. Worms. 1987. Status of the southern Gulf of St. Lawrence scallop stocks - 1986. Can. Atl. Fish. Sci. Adv. Com., Res. Doc. 87/84.

Worms, J., M. Lanteigne and L.-A. Davidson. 1986. Status of the southern Gulf of St. Lawrence scallop stocks - 1985. Can. Atl. Fish. Sci. Adv. Com., Res. Doc. 86/55.

Endnotes

a. A small portion of the landings consists of Iceland scallops, *Chlamys islandica*. This species is caught in small proportions with the giant scallop on the Lower North Shore (≈30%) and the Iles-de-la-Madeleine (≈10%) of the Québec Region.

b. Dredge width is measured as the cumulative total of the maximum outside measurements of each bucket.

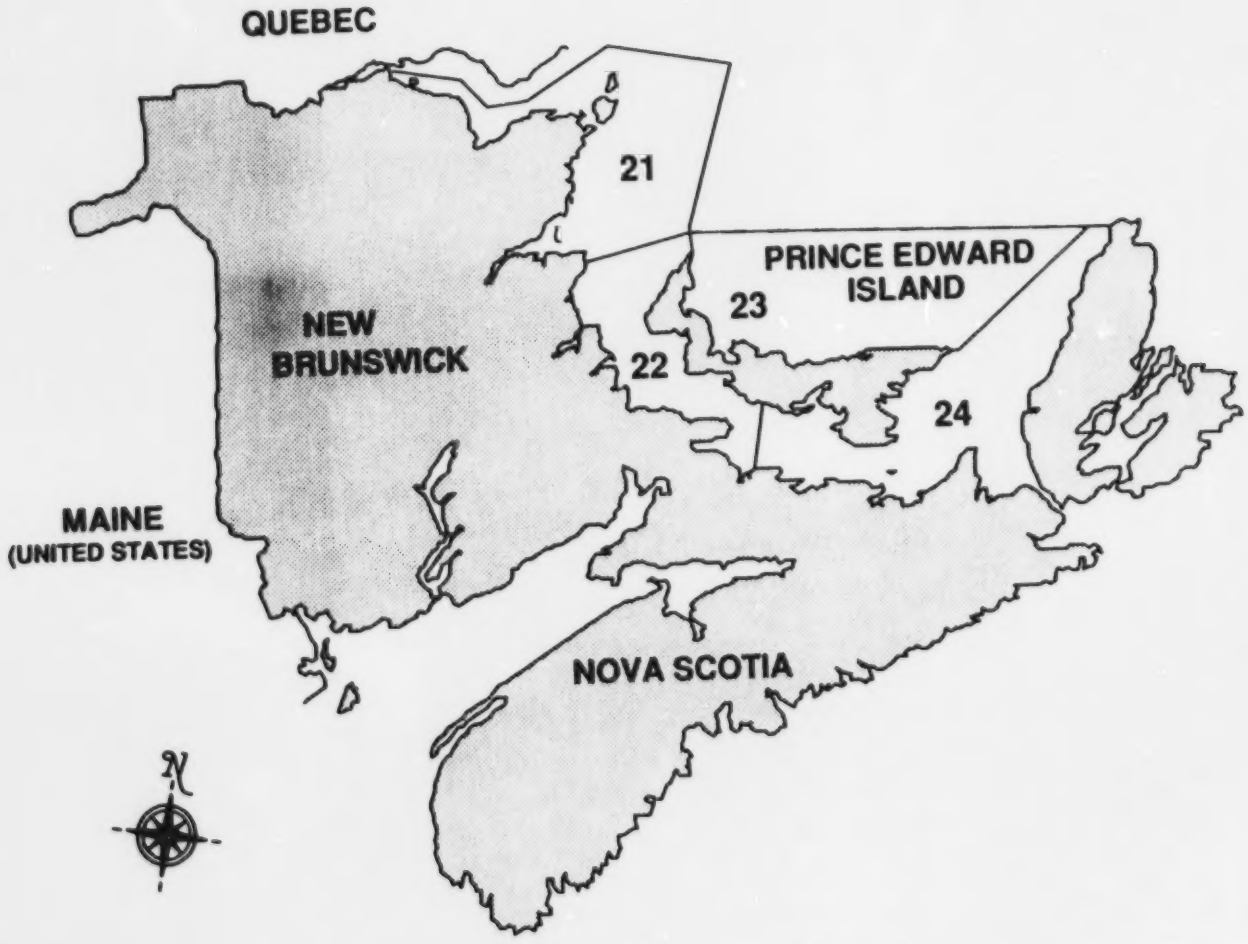


Figure 1. Scallop fishing areas in the southern Gulf of St. Lawrence (Fisheries and Oceans, Gulf Region).

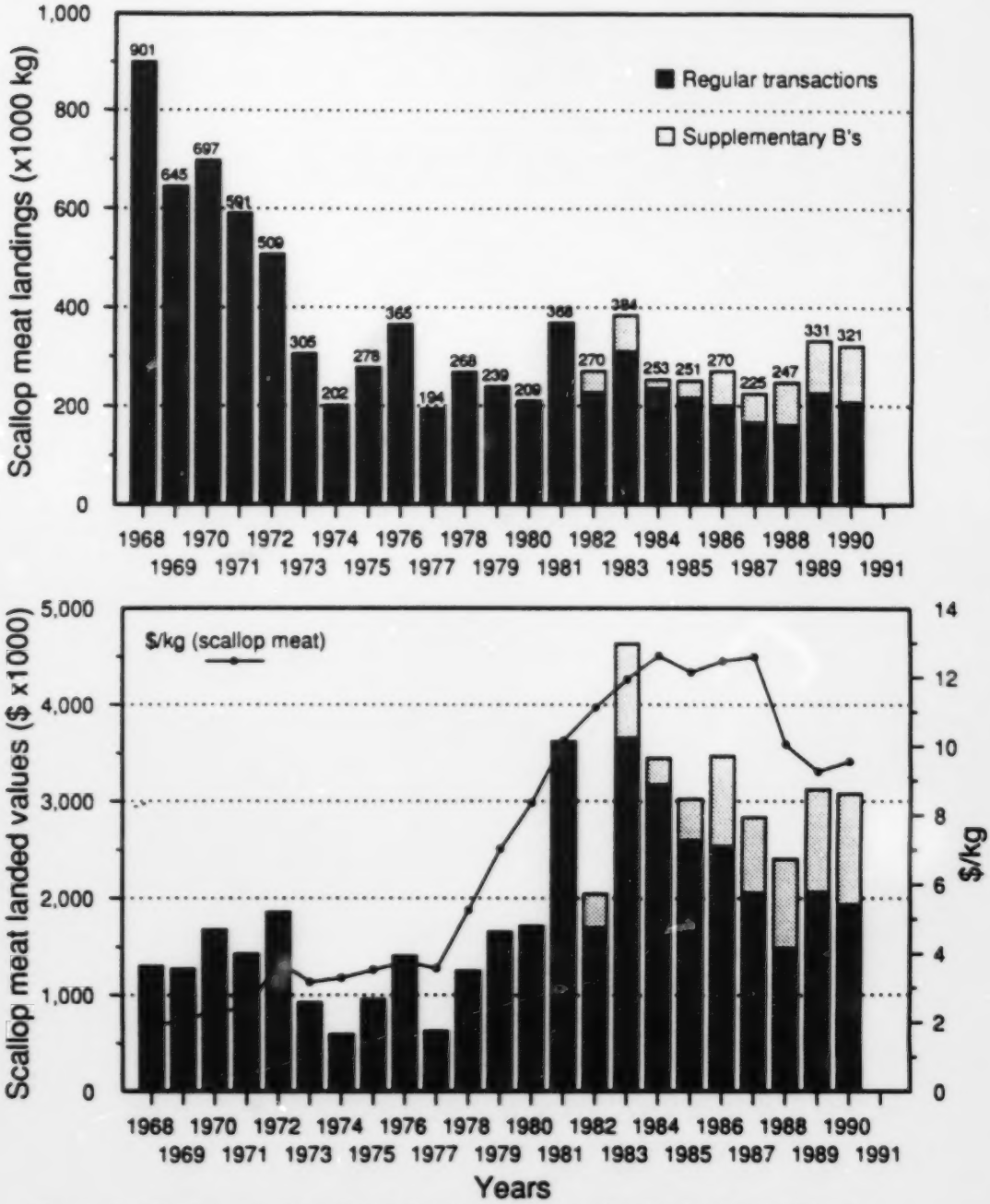


Figure 2. Scallop meat landings, landed values and price/kg in combined fishing areas 21, 22, 23 and 24 of the Gulf Region. Live scallop landings were converted to scallop meat weights by dividing live scallop landings by 8.3. Conversion factor was not applied for scallop roe landings (as it has not yet been determined). The 1991 catch and effort data were not available.

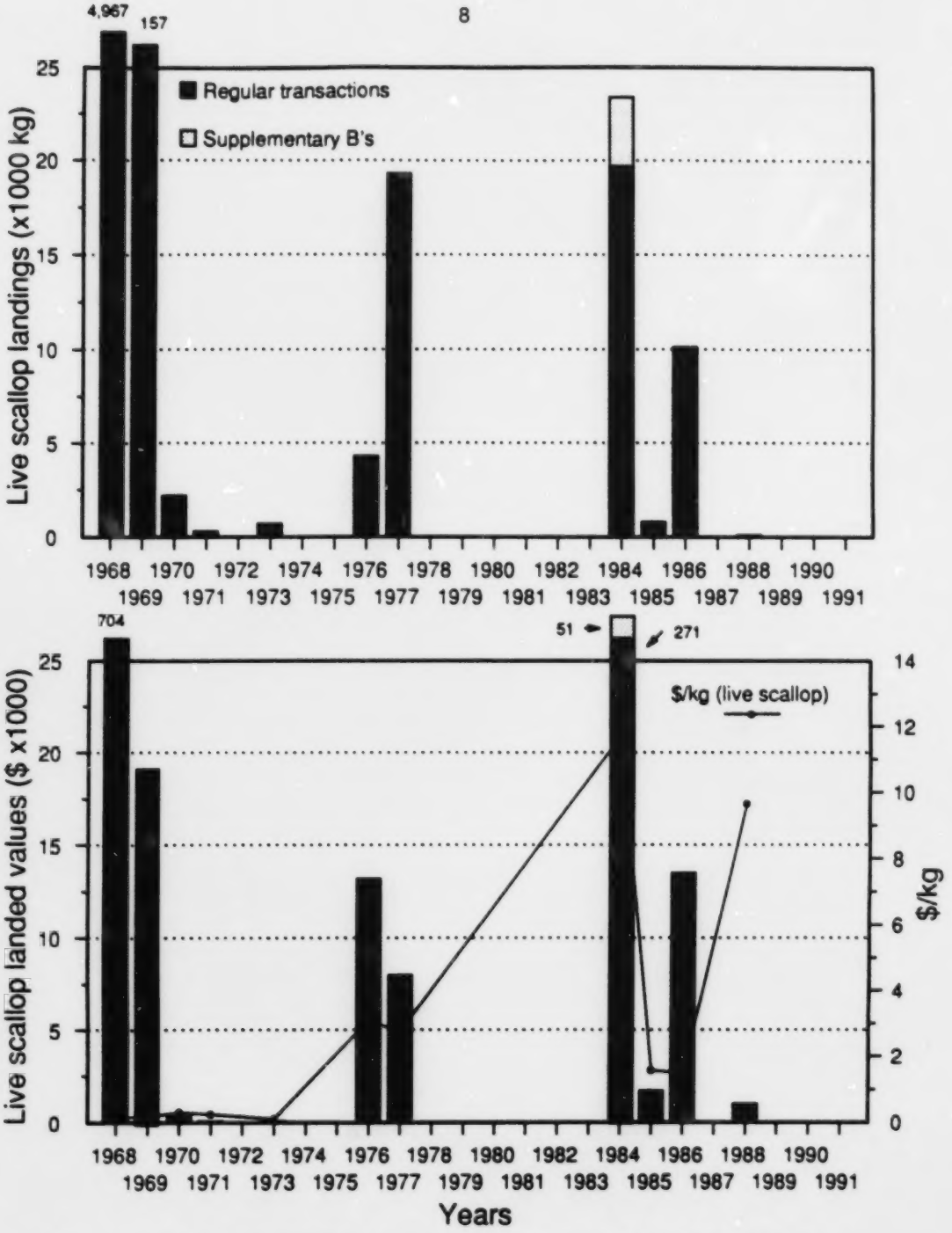


Figure 3. Total live scallop landings, landed values and price/kg in combined scallop fishing areas 21, 22, 23 and 24 of the Gulf Region. The 1991 catch and effort data were not available.

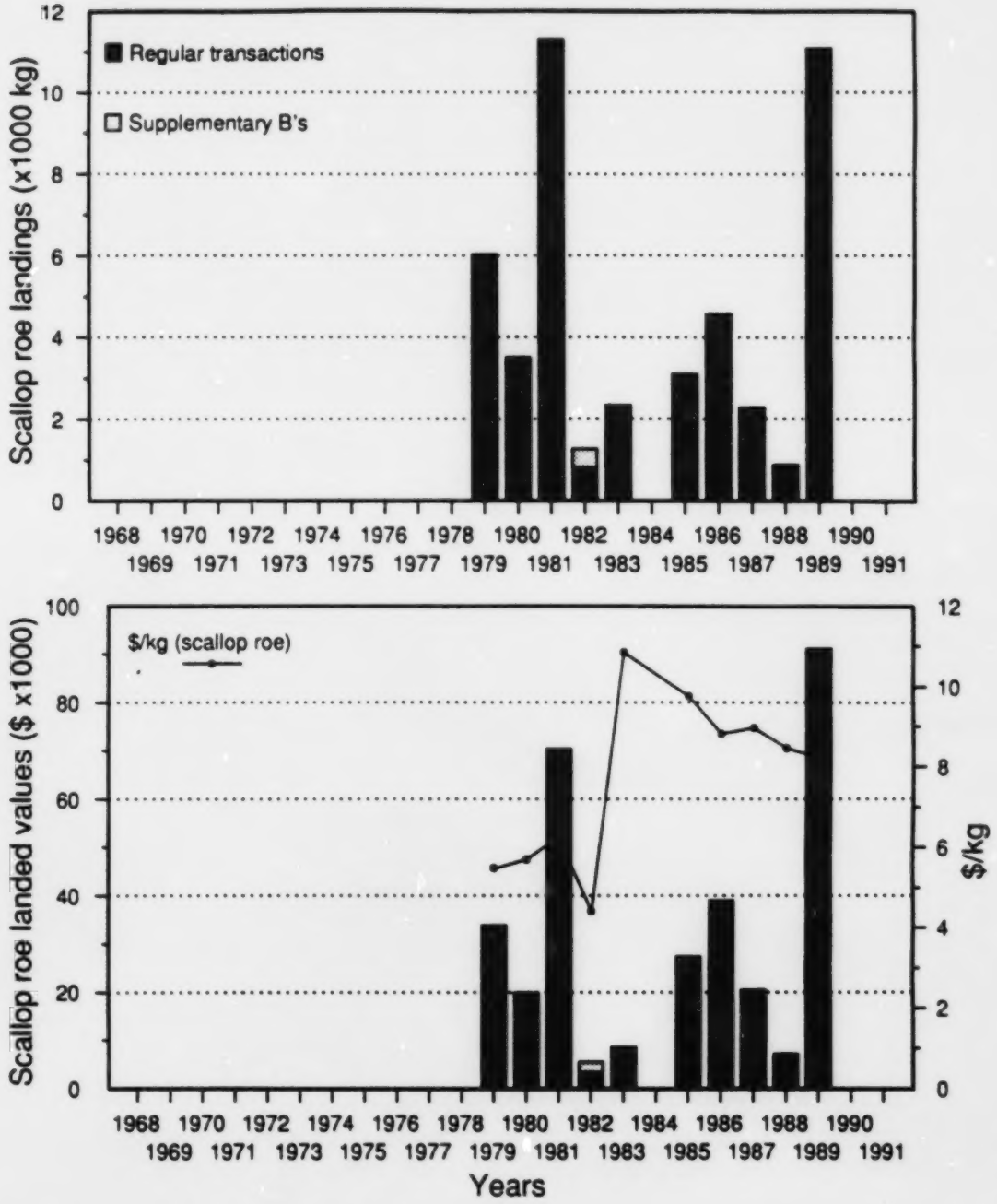
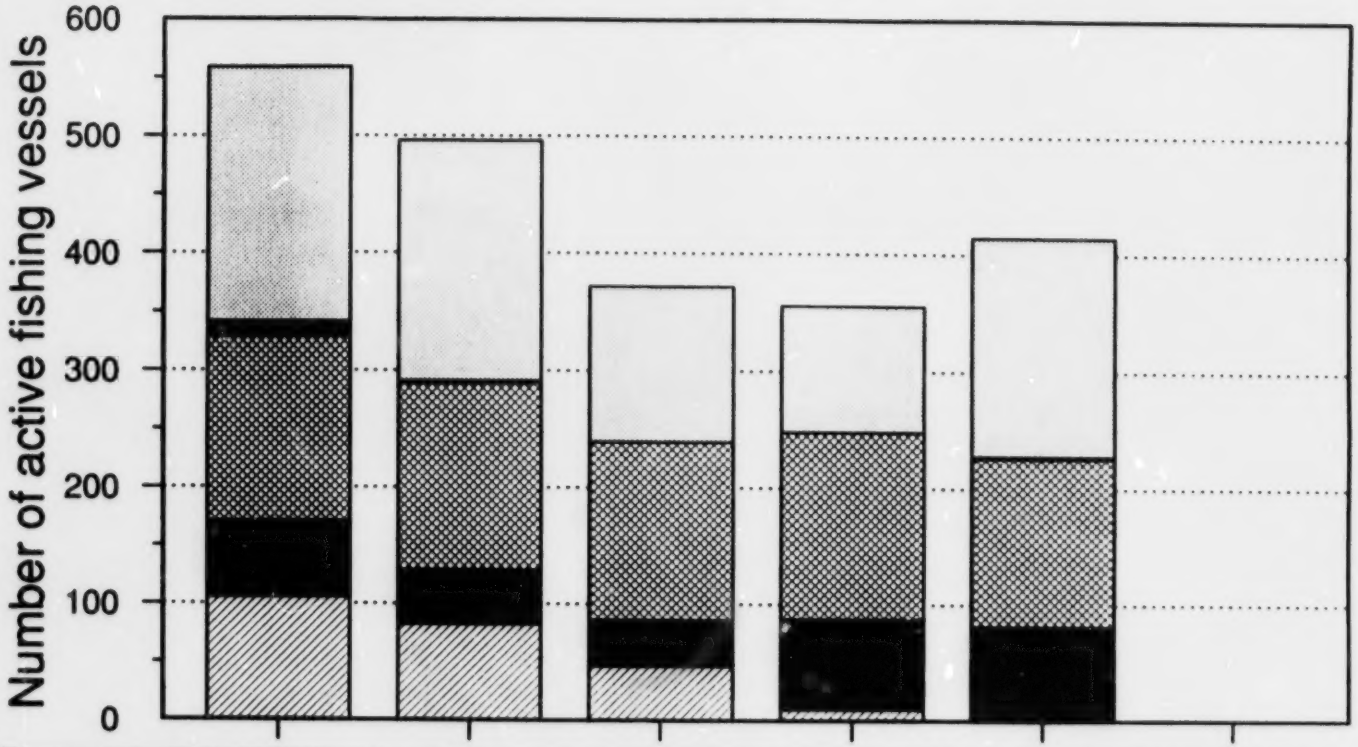
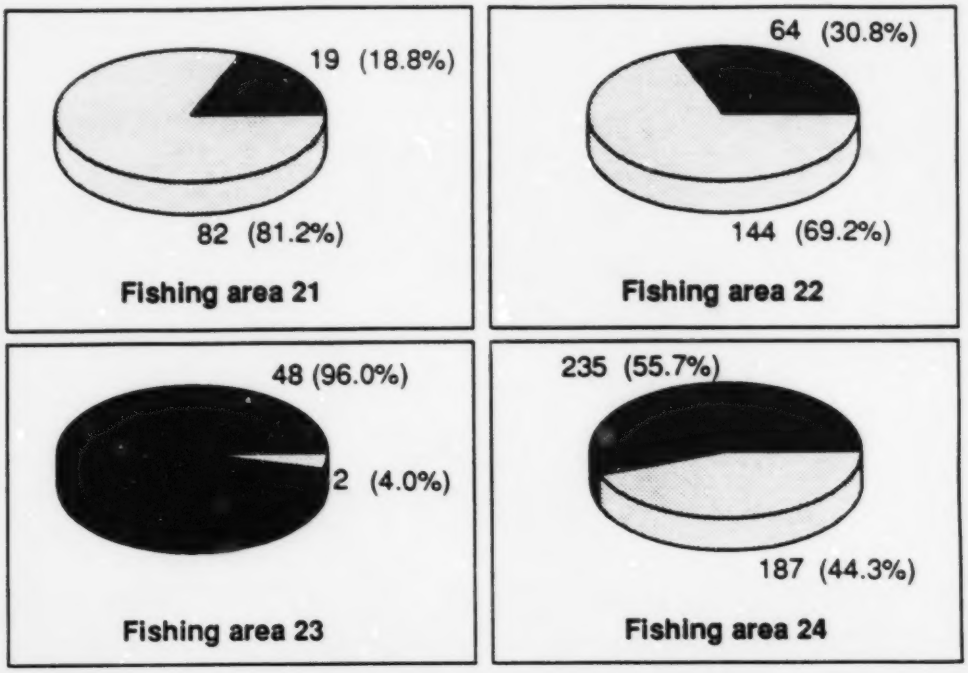


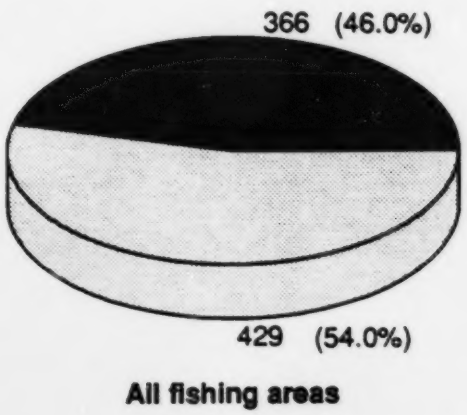
Figure 4. Total scallop roe landings, landed values and price/kg in combined scallop fishing areas 21, 22, 23 and 24 of Gulf Region. The 1991 catch and effort data were not available.



Years	1986	1987	1988	1989	1990	1991
Outside Gulf Region	106	83	47	10	0	
Area 21	65	46	40	78	82	
Area 22	158	160	152	160	144	
Area 23	13	2	0	0	2	
Area 24	217	205	133	108	187	
Total	559	496	372	356	415	

Figure 5. Number of active fishing vessels by fishing area as reported in the catch and effort data files. The 1991 catch and effort data were not available.





Inactive vessels

Active vessels

Figure 6. Numbers and proportions of active and inactive fishing vessels as per the catch and effort data and the number of scallop fishing licences issued in 1990. It was assumed that one fishing licence represented one fishing vessel.

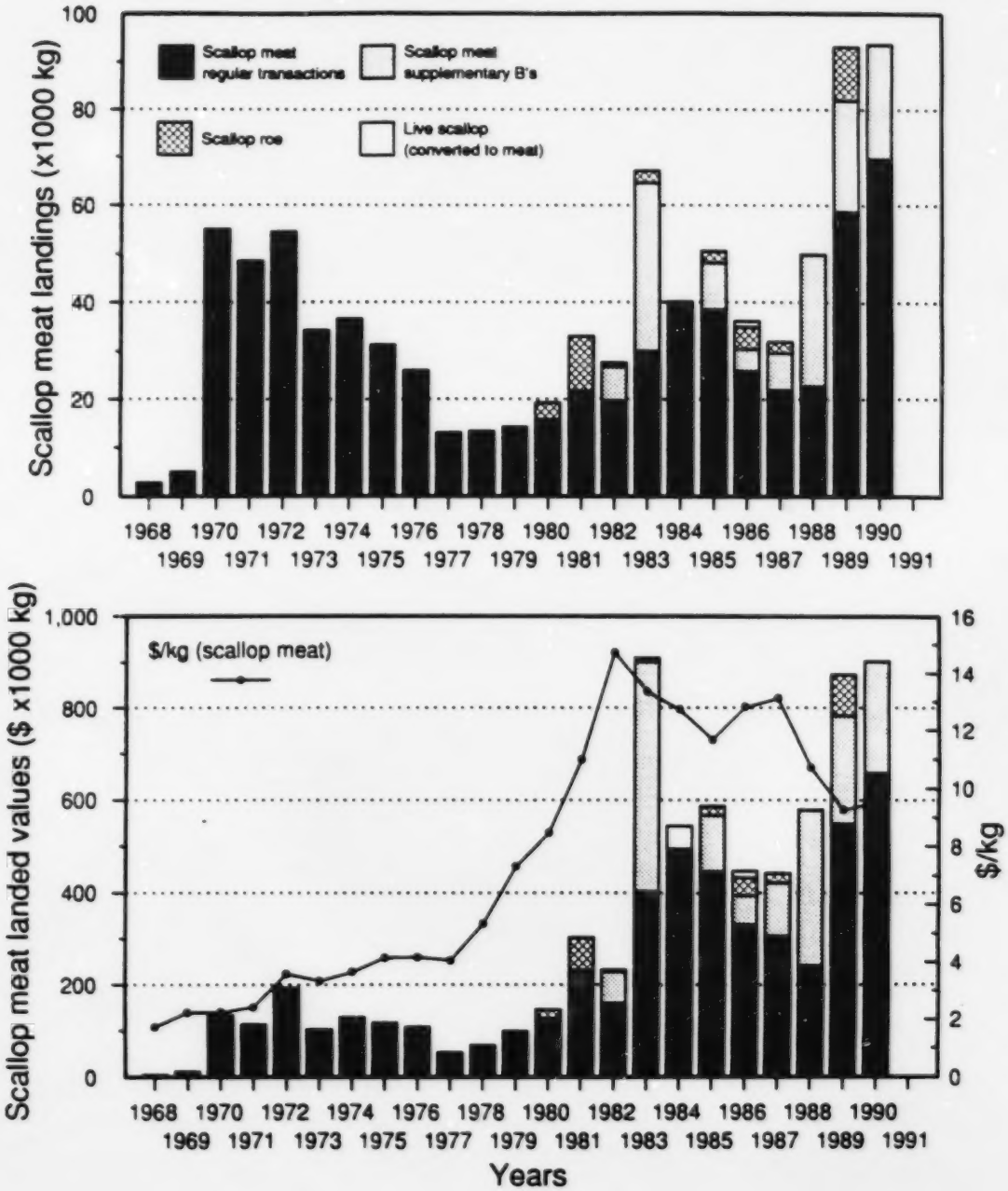


Figure 7. Scallop landings (all types), landed values and price/kg in fishing area 21. Live scallop landings were converted to meat weight by dividing live scallop weights by 8.3. Conversion factor was not applied for scallop roe (as it has not yet been determined). The 1991 catch and effort data were not available.

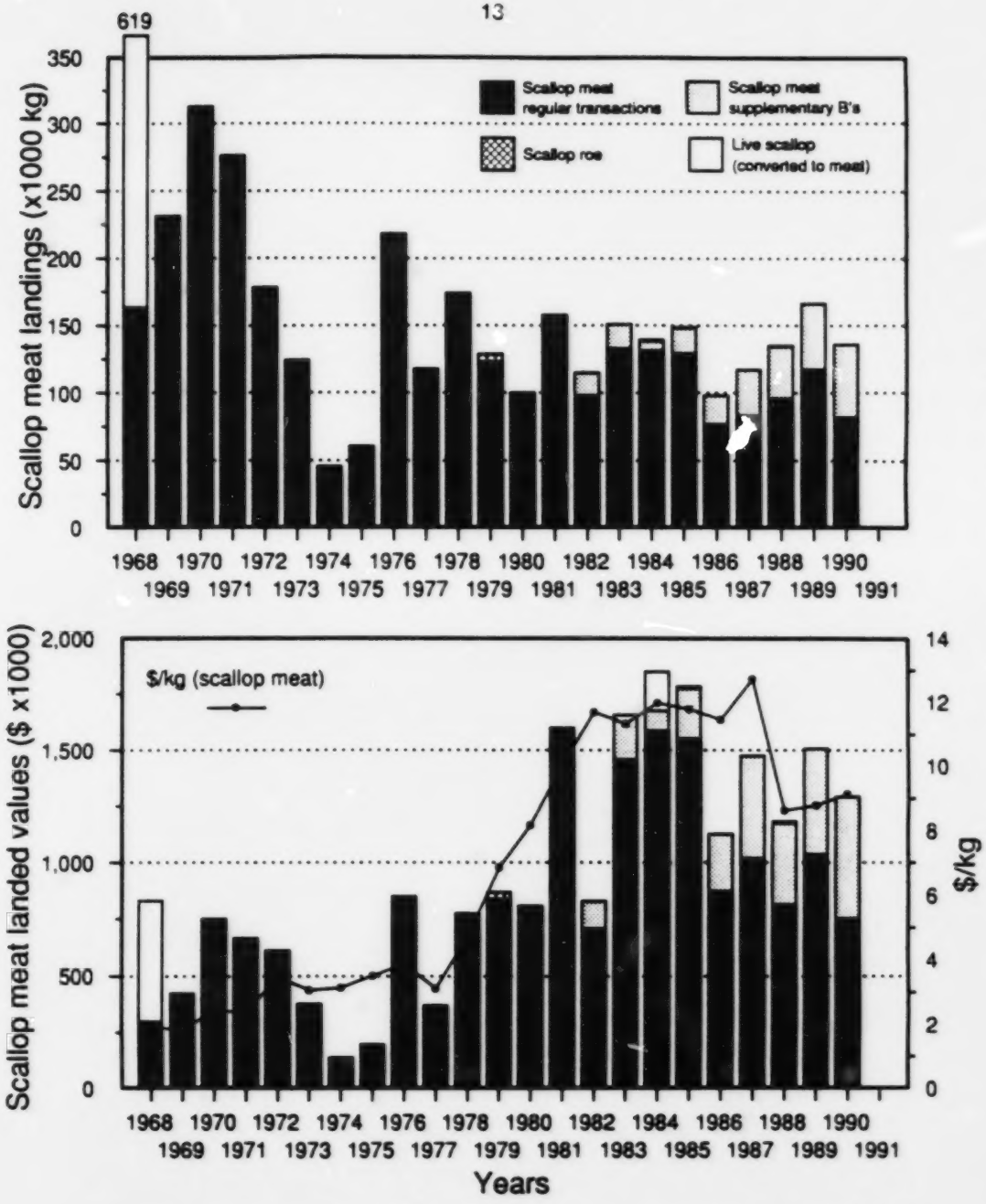


Figure 8. Scallop landings (all types), landed values and price/kg in fishing area 22. Live scallop landings were converted to meat weight by dividing live scallop weights by 8.3. Conversion factor was not applied for scallop roe (as it has not yet been determined). The 1991 catch and effort data were not available.

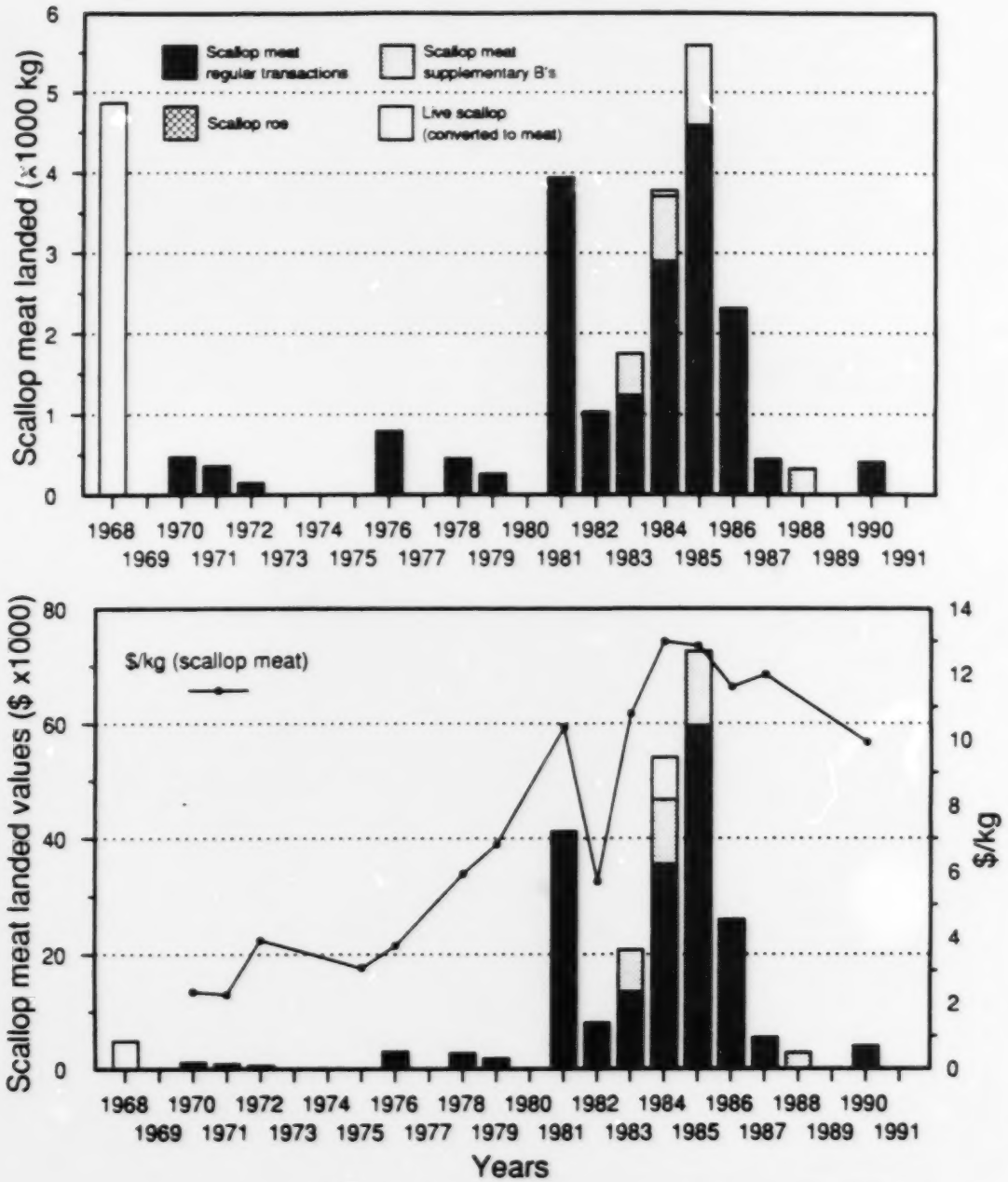


Figure 9. Scallop landings (all types), landed values and price/kg in fishing area 23. Live scallop landings were converted to meat weight by dividing live scallop weights by 8.3. Conversion factor was not applied for scallop roe (as it has not yet been determined). The 1991 catch and effort data were not available.

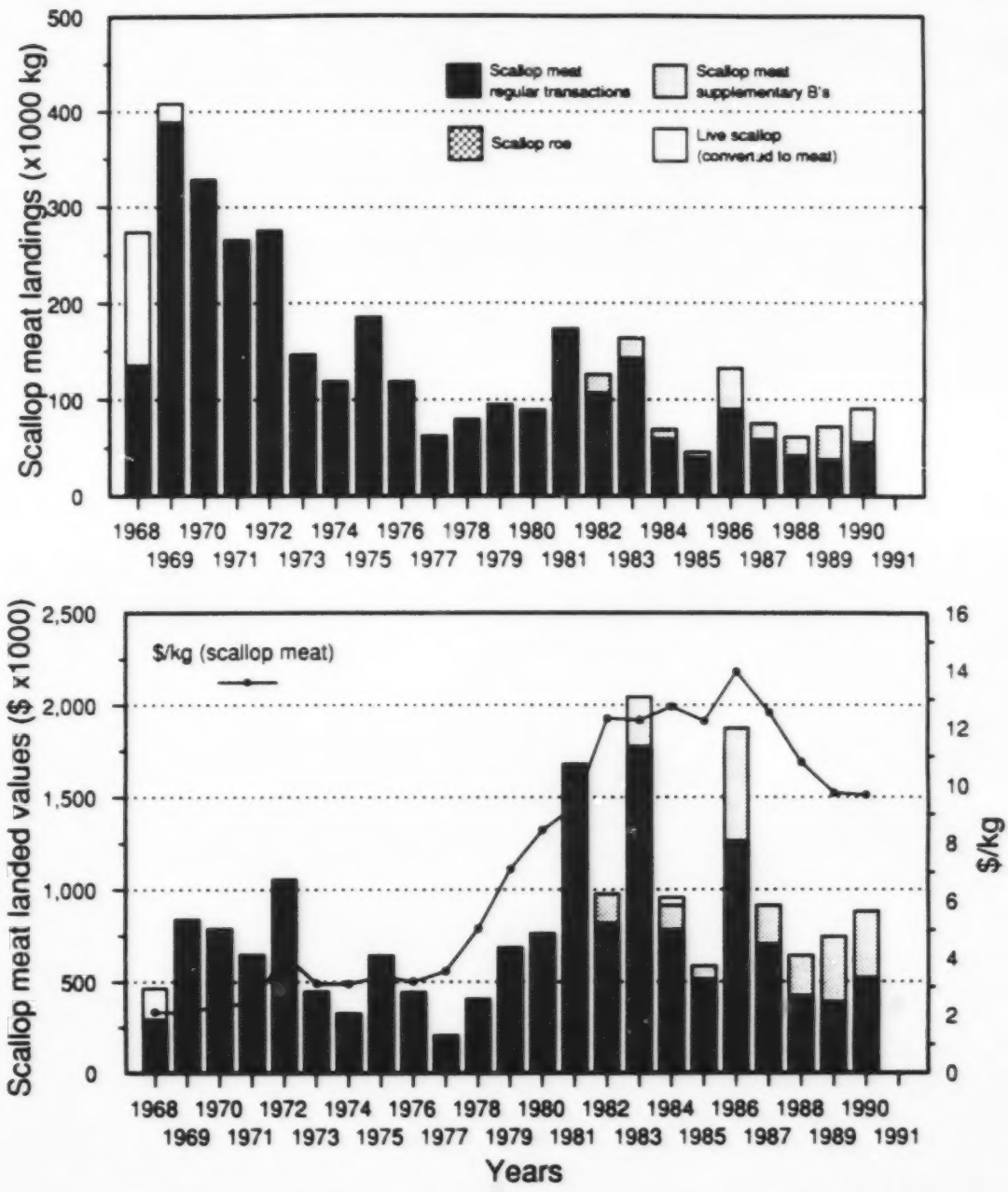


Figure 10. Scallop landings (all types), landed values and price/kg in fishing area 24. Live scallop landings were converted to meat weight by dividing live scallop weights by 8.3. Conversion factor was not applied for scallop roe (as it has not yet been determined). The 1991 catch and effort data were not available.

Appendix I Total giant scallop landings and landed values in the southern Gulf of St Lawrence for each landing type and for all landing types combined **(supplementary B's are not included)**

YEAR	Scallop meat landings, all fishing areas		Live scallop landings, all fishing areas			Scallop roe landings, all fishing areas		Total for all landing types and all fishing areas **	
	Landings (t)	Values ($ x1000)	Landings (t)	Converted * landings (t)	Values ($ x1000)	Landings (t)	Values ($ x1000)	Landings (t)	Values ($ x1000)
1968	301.3	598.5	4976.0	599.5	704.0			900.8	1302.5
1969	626.2	1253.4	157.1	18.9	18.9			645.1	1272.3
1970	697.1	1673.7	2.2	0.3	1.4			697.4	1675.1
1971	591.3	1425.9	0.3	0.04	0.3			591.3	1426.2
1972	508.6	1857.6						508.6	1857.6
1973	305.2	922.8	0.7	0.1	0.1			305.3	922.9
1974	202.0	592.2						202.0	592.2
1975	277.6	955.4						277.6	955.4
1976	364.1	1388.8	4.3	0.5	13.[illegible]			364.6	1402.0
1977	191.8	620.0	19.3	2.3	8.0			194.1	628.0
1978	267.8	1249.4						267.8	1249.4
1979	232.6	1620.0				6.0	33.9	238.6	1653.9
1980	205.9	1695.8				3.5	19.8	209.4	1715.6
1981	357.2	3549.3				11.3	70.3	368.5	3619.6
1982	226.6	1691.7				0.8	3.4	227.5	1695.1
1983	307.8	3646.9				2.3	8.6	310.2	3655.5
1984	233.6	2898.3	19.7	2.4	271.4			236.0	3169.7
1985	213.0	2569.9	0.8	0.1	1.7	3.0	27.3	216.1	2598.9
1986	195.9	2489.8	10.1	1.2	13.5	4.6	39.0	201.7	2542.3
1987	164.3	2032.7				2.3	20.3	166.6	2053.0
1988	160.8	1479.1	0.1	0.01	1.0	0.9	7.1	161.7	1487.3
1989	214.7	1973.4				11.1	91.1	225.8	2064.5
1990	208.4	1938.3						208.4	1938.3
1991	data not available		data not available			data not available			

* = Live scallop landings are converted into scallop meat weights by dividing live scallop landings by 8.5. Scallop roe landings are not converted.

** = To obtain grand total giant scallop landings/values for the southern Gulf, add total landings/values in Appendix I with the supplementary B's total landings/values in Appendix II

Appendix II Giant scallop meat (adductor muscle) landings and landed values reported on supplementary B transactions for each fishing area in the southern Gulf of St. Lawrence (supplementary B transactions were not identified in the catch and effort data prior to 1982)

Years	Scallop meat landings (t) by fishing area				Scallop meat landed values ($ x1000)				Total landings/values	
	21	22	23	24	21	22	23	24	t	$ x1000
1968										
1969										
1970										
1971										
1972										
1973										
1974										
1975										
1976										
1977										
1978										
1979										
1980										
1981										
1982	7.0	16.7		18.8	68.8	119.9		157.7	42.5	346.4
1983	34.8	17.9	0.5	20.7	497.8	200.4	7.3	269.4	73.9	974.9
1984		6.5	0.8	9.5		89.2	11.2	131.0	16.8	231.4
1985	9.8	18.8	1.0	5.6	121.4	223.7	13.0	69.4	35.2	427.5
1986	4.6	21.5	0.05	42.2	62.9	253.4	0.6	611.5	68.5	928.3
1987	7.6	34.0		16.7	114.9	457.7		210.8	58.4	783.4
1988	27.2	36.4	0.3	19.7	336.3	360.3	2.8	218.4	85.7	917.8
1989	23.1	48.6		33.9	233.8	469.1		355.1	105.6	1058.0
1990	23.8	54.1		34.7	244.3	539.2		360.0	112.6	1143.5
1991	data not available				data not available					

0.4 t of scallop roes were reported on supplementary B's in fishing area 21, in 1982 (landed value $ x1000 = 2.0).
3.7 t of live scallops were reported on supplementary B's in fishing area 24, in 1984 (landed value $ x1000 = 50.9).

Appendix III. Giant scallop meat (adductor muscle) landings, landed values and $/kg for each fishing area in the southern Gulf of St. Lawrence (supplementary B's not included)

Years	Scallop meat landings (t)				Scallop meat landing values ($ x1000)				Scallop meat values ($/kg)			
	Fishing areas				Fishing areas				Fishing areas			
	21	22	23	24	21	22	23	24	21	22	23	24
1968	2.5	162.7		136.0	4.3	300.2		293.9	1.72	1.91		2.14
1969	5.1	231.8		389.3	11.5	423.3		818.6	2.23	1.85		2.10
1970	54.9	313.1	0.5	328.6	133.6	751.0	1.1	788.0	2.24	2.44	2.36	2.40
1971	48.6	276.3	0.4	266.1	113.3	664.7	0.8	647.1	2.42	2.39	2.28	2.41
1972	54.5	177.9	0.1	276.1	192.9	610.0	0.6	1054.2	3.58	3.46	3.92	4.15
1973	34.1	124.2		146.9	102.0	375.3		445.5	3.34	3.06		3.12
1974	36.6	46.0		119.4	128.3	138.6		325.4	3.64	3.14		3.11
1975	31.1	60.4		186.0	117.0	197.1		641.3	4.13	3.50	3.09	3.38
1976	25.9	218.5	0.8	119.0	107.5	848.7	3.0	429.7	4.16	3.87	3.76	3.20
1977	13.1	117.9		60.8	52.7	367.7		199.7	4.04	3.11		3.56
1978	13.4	173.9	0.5	80.2	67.8	773.1	2.7	405.8	5.31	4.71	5.93	5.04
1979	13.8	123.1	0.3	95.4	95.7	836.4	1.8	686.2	7.30	6.84	6.82	7.10
1980	15.7	100.4		89.7	125.8	806.2		763.7	8.46	8.16		8.45
1981	21.7	157.5	3.9	174.0	231.2	1599.5	41.2	1677.3	10.99	10.04	10.37	9.29
1982	19.7	98.4	1.0	107.5	159.1	706.0	8.0	816.5	14.72	11.68	5.71	12.32
1983	29.9	133.1	1.2	143.6	402.6	1456.8	13.5	1774.0	13.36	11.32	10.78	12.28
1984	39.6	131.7	2.9	59.5	493.6	1587.1	35.6	781.9	12.73	11.97	12.98	12.75
1985	38.5	129.2	4.6	40.7	445.0	1551.8	59.6	513.6	11.67	11.78	12.86	12.23
1986	25.7	77.1	2.3	90.8	330.3	871.4	25.4	1262.7	12.82	11.45	11.61	13.95
1987	21.9	83.4	0.4	58.5	305.9	1017.4	5.4	703.9	13.12	12.72	11.98	12.54
1988	22.6	96.1		42.1	241.1	814.7		423.3	10.71	8.62		10.81
1989	58.7	117.6		38.4	547.6	1037.7		388.1	9.25	8.78		9.74
1990	69.7	82.0	0.4	56.3	657.6	753.5	4.0	523.1	9.51	9.12	9.92	9.67
1991	data not available				data not available				data not available			

Appendix IV. Live giant scallop landings, landed values and $/kg for each fishing area in the southern Gulf of St. Lawrence **(supplementary B's not included)**

Years	Live scallop landings (t)				Live scallop landed values ($ x1000)				Live scallop values ($/kg)			
	Fishing areas				Fishing areas				Fishing areas			
	21	22	23	24	21	22	23	24	21	22	23	24
1968	2.8	3785.6	40.4	1147.1		531.1	4.9	168.1		0.15	0.12	0.13
1969		0.1		157.0		0.03		18.8		0.22		0.16
1970	1.4			0.8	0.3			0.1	0.43			0.16
1971	0.3				0.1				0.24			
1972												
1973		0.7				0.1				0.10		
1974												
1975												
1976				4.3				13.2				3.09
1977		0.3		19.0		1.4		6.6		4.15		1.37
1978												
1979												
1980												
1981												
1982												
1983												
1984	4.1	11.2	0.6	3.9	50.1	172.0	7.3	42.0	9.93	12.35	12.41	12.14
1985	0.6			0.2	1.3			0.4	1.7			1.43
1986	9.9			0.2	13.1			0.4	1.33			1.65
1987												
1988				0.1		0.4		0.6		8.27		11.02
1989												
1990												
1991	data not available				data not available				data not available			

Appendix V Giant scallop roe landings, landed values and $/kg for each fishing area in the southern Gulf of St. Lawrence **(supplementary B's not included)**.

Years	Scallop roe landings (t)				Scallop roe landed values ($ x1000)				Scallop roe values ($/kg)			
	Fishing areas				Fishing areas				Fishing areas			
	21	22	23	24	21	22	23	24	21	22	23	24
1968												
1969												
1970												
1971												
1972												
1973												
1974												
1975												
1976												
1977												
1978												
1979	0.4	5.6			2.3	31.6			5.32	5.64		
1980	3.5				19.8				5.70			
1981	11.3				70.3				6.25			
1982	0.8				3.4				4.41			
1983	2.3				8.6				10.84			
1984												
1985	2.3	0.8			19.0	8.3			8.59	10.92		
1986	4.6				39.0				8.82			
1987	2.3				20.3				8.96			
1988	0.1	0.8			1.1	6.0			8.82	8.09		
1989	11.1				91.1				8.22			
1990												
1991	data not available				data not available				data not available			